

Laucks ⁸⁰ years

Testing Laboratories, Inc.

940 South Harney St., Seattle, WA 98108 (206) 767-5060 FAX 767-5063

Certificate

Chemistry, Microbiology and Technical Services

CLIENT: Alaskan Copper Works
P.O. Box 3546
Seattle, WA 98124
ATTN: Jim Brown

LABORATORY NO. 12867

DATE: Nov. 9, 1988

PO #M7598

REPORT ON: WATER/ACID

SAMPLE

IDENTIFICATION: Submitted 10/31/88 and identified as shown:

- 1) M7598 10/4
- 2) M7598 10/6
- 3) M7598 10/11
- 4) M7598 10/13
- 5) M7598 10/18
- 6) M7598 10/20
- 7) M7598 10/25
- 8) M7598 10/27
- 9) M7598 10/28 3600
- 10) M7598 10/28 3200
- 11) M7598 10/28 3600

parts per million (mg/L)

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>
Zinc	0.024	0.016	0.016	0.076	0.020	0.018
Chromium	0.52	0.28	0.56	0.54	0.42	0.40
Copper	0.12	0.17	0.080	0.22	0.20	0.082
Nickel	0.27	0.09	0.16	0.54	0.24	0.13



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PAGE NO. 2

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parts per million (mg/L)

	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>Lab Blank</u>
Zinc	0.026	0.018	0.018	10.	1600.	<0.002
Chromium	0.46	0.48	0.080	440.	30.	<0.005
Copper	0.22	0.27	0.012	340.	44.	<0.002
Nickel	0.24	0.31	0.06	5100.	920.	<0.01

	<u>10</u>	<u>11</u>
Specific Gravity @ 25°C	*	1.124
Total Acidity, calculated as % HNO ₃ (methyl orange end point)	3.9	8.3

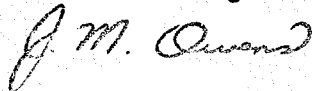
Key

< = less than

* Insufficient sample for analysis

Respectfully submitted,

Laucks Testing Laboratories, Inc.



J. M. Owens

JMO:veg



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AKC-0015289

Chemistry, Microbiology, and Technical Services

PAGE NO. 3

Alaskan Copper Works

LABORATORY NO. 12867

APPENDIX

Matrix Spike/Matrix Spike Duplicate Report

		<u>parts per million (mg/L)</u>				<u>mg/L</u>					
<u>Sample</u>	<u>Analyte</u>	<u>Spike Level</u>	<u>Sample Result</u>	<u>MS Result</u>	<u>% Rec</u>	<u>MSD Result</u>	<u>% Rec</u>	<u>RPD</u>	<u>QC LIMITS RPD</u>	<u>REC</u>	
1	Chromium	0.10	0.52	0.60	80.	0.60	80.	0.	*		
1	Zinc	0.10	0.024	0.10	78.	0.11	90.	14.**	6	64-127	
1	Copper	0.10	0.12	0.23	106.	0.24	118.	11.*	7	65-122	
1	Nickel	0.20	0.27	0.46	97.	0.49	110.	12.*	5	66-125	

* Samples are spiked prior to preparation and analysis at a level deemed to be generally appropriate to the average sample processed in the laboratory. In this case, the level of analyte already present in the sample was large enough to make an accurate determination of spike recovery impossible.

** Persistently poor surrogate and spike recoveries signal a laboratory problem and the need for re-extraction and re-analysis. However, occasional outliers are regarded as anomalies and, in this case, re-analysis was not deemed necessary because other indicators were in control.

MS = Matrix Spike

MSD = Matrix Spike Duplicate

Rec = Recovery

RPD = Relative Percent Difference



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